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ABSTRACT

To investigate the development of symbolic play, 18 Japanese normal boys and girls were individually tested once every even-numbered month from when they were 12 to 24 months of age. Symbolic play was generally defined as behavior which represents actual or imagined experience by using objects, gesture or language alone or in combination. The symbolic play behavior was further specified in terms of three types of representation (material, gestural, verbal), three types of agent use (self, passive other, active other), and three types of elaborated acts (unordered, combination, and organized multi-scheme combinations). Testing took place in laboratory settings with materials composed of three sets of miniature toys, a doll, and junk materials. Each set was presented for 5 minutes and the subject's spontaneous behavior was videotaped. Additionally, a trained observer took notes when there was difficulty in interpreting the subject's pretend behavior, especially when substitute use of the materials or gestural representation occurred. After each session, the observer asked the mother about these behaviors as well as the subject's pretend use of real objects in everyday life. Seven items of data were selected as measures of the development of symbolic play such as percentage of occurrence of symbolic play, substitute object use, and other agent use; and total number of different acts and different referents in substitute object use. (Author/RH)

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DEVELOPMENT OF SYMBOLIC PLAY IN LATE INFANCY

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In our previous longitudinal study on symbolic play in the second year of life (Shimada et al., 1979), our four children showed the same developmental processes as those of children in Western societies. They revealed a sequence of emergence from imitative to substitute and then to gestural use of objects or a progression from a simple or single to an elaborated act, e.g., combined, varied, sequential, planned, etc. as seen in studies by other researchers (Belsky & Most, 1981; Elder & Pederson, 1978; Fenson et al., 1976; Jackowitz & Watson, 1980; Inhelder et al., 1972; Nicolich, 1977, 1981; Piaget, 1945/1962). The order of appearance of agent use in their symbolic play was from self to passive other and then to active other, which was consistent with other studies (Belsky & Most, 1981; Fenson & Ramsay, 1980; Inhelder et al., 1972; Lowe, 1975; Nicolich, 1977, 1981; Watson & Fischer, 1977). In spite of the above progression, however, their symbolic play was dominated in general by imitative object use and self agent use until 24 months of age. In addition, it was suggested that the number of different symbolic acts was a more appropriate developmental index than the percentage of occurrences at this age level. This idea was supported by the study with normal and retarded children of Jeffree & McConkey (1976). Our four children also showed marked individual differences in the developmental pace of symbolic play despite their same developmental sequence. Such individual differences were reported by Inhelder et al. (1972), Nicolich (1977) and

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* This study was conducted when the second author was a special student of Tokyo Gakugei University.

Piaget (1945/1962) as well. Wolf & Gardner (1979) noted individual differences exemplifying 2 types of children; that is, patterner and dramatist. Symbolic play of the patterner was attribute mapping and object centered, whereas that of the dramatist was focused on event structure and persons.

The purpose of this study was not only to confirm our previous findings with a larger sample, but also to examine in more detail the development of symbolic play in terms of sequence of onset and age trends of increment in measures of symbolic play and individual differences of development. The observation of symbolic play was longitudinally conducted from 12 to 24 months of age in laboratory settings.

METHOD

1. Subjects

The subjects were 18 Japanese firstborn normal children (9 males, 9 females) from middle-class families. They were selected from the files of the Well Babies Clinic at Kosei Hospital in Tokyo where their neurological, physical and psychological development had been examined regularly. Their cognitive and language development has been followed experimentally in this institute since the age of 6 months.

2. Materials

The materials consisted of 3 sets of miniature toys, junk materials and a doll or a stuffed toy dog the latter three of which were common to each set. The doll and dog were about 30 cm high dressed either as a boy or girl. The junk materials were 3 types of twigs (large, small and Y-shaped, 10 - 20 cm in length) and a crumpled piece of white paper (15 x 15 cm). The miniature toys in each set were as follows:

Set I tea cup, spoon, hat, cloth shoulder bag.

Set II rice bowl, plate, chopsticks, square table.

Set III* hand mirror, comb, toothbrush, hand towel.

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* Miniature toys of Set III were changed from those in our previous study (Shimada et al., 197[illegible]) due to the subjects' less frequent manipulation of them than the toys of the other 2 sets.

There was one of each object except for chopsticks in which case there was one pair, in a size appropriate for the doll's or dog's use. Most of the miniature toys were white except for the shoulder bag, the comb and the toothbrush which were yellow, and the table which was brown.

3. Procedure

The experiment was conducted in a small carpeted room at this institute without any equipment except for air-conditioning. The room was divided into two parts by a screen for observing and videotape recording. The subjects were individually tested by a female experimenter in a presence of his or her mother once every even numbered months from the age of 12 months to 24 months. The experimenter was familiar to the subject. Prior to a session, the experimenter let the subject choose a doll or dog for each session. The selected doll or dog and one set of materials were arranged in a standard pattern on a board and presented on the floor in front of the subject. Each set was presented for 5 minutes and the subject's spontaneous behavior was observed. The order of presentation of the sets was counterbalanced across sessions. The mother was instructed neither to initiate nor to teach the manipulation of the materials. However, she was encouraged to play with her child, limiting her pretend behavior to her child's repertory when her child approached her in that way. The experimenter behaved in the same manner.

4. Recording

A trained observer took notes when there was difficulty in interpreting the subject's pretend behavior, especially when substitute use of the materials or gestural representation occurred. After each session, the observer asked the mother about these behaviors as well as the subject's pretend use of real objects in everyday life. The whole procedure was videotaped. The tape was copied and 1 sec time intervals were marked off. The observer cooperated with another trained observer to describe the subject's behavior with a given form marked off in 5 sec time intervals based on the copied videotape recording and what the mother explained about her child's behavior.

5. Measures of Symbolic Play

Symbolic play was defined as behavior which represents actual or imagined experience by using objects, gesture or language alone, or in combination. A detailed explanation is shown in Table 1. The following were selected as measures of development of symbolic play:

(1) Age in months of onset of each type of object and agent use, and of elaborated acts
(2) Percentage of occurrence of symbolic play
(3) Total number of different acts
(4) Number of different elaborated acts
(5) Percentage of substitute object use, gestural and verbal representation within symbolic play*
(6) Number of different referents in substitute object use, gestural and verbal representation*
(7) Percentage of other agent use within symbolic play*

The frequency of symbolic play was counted by whether it occurred or not in a 5 sec time interval. The percentage of occurrence of symbolic play was calculated as follows:

$$\frac{\text{frequency of symbolic play}}{\text{frequency of non-symbolic manipulation and symbolic play}} \times 100$$

The above computation was used in order to exclude motivational factors as much as possible. When counting the number of different acts, the same act with different materials was credited as one, e.g., eating with a spoon and eating with a twig as a substitute for the spoon. An elaborated act referred to a combination of 2 different acts. Therefore, the number of different elaborated acts was the number of different combinations of 2 different acts. Each component of elaborated acts was also scored as a simple or single act.

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* Since gestural and verbal representation and active other agent use occurred in a part of subjects and/or at a very low frequency, the first two behaviors were combined with substitution while active other agent use was combined with passive other agent use.

RESULTS

1. Developmental Sequence of Onset of the Measures of Symbolic Play

Fig. 1 shows the ages of onset of the measures of symbolic play. While the definition of elaborated acts in this study does not include single scheme combinations toward 2 different agents, e.g., the subject's drinking and then giving a drink to the doll (see Table 1), the onset of this behavior was also checked in order to compare with the results from other previous studies. Other 3 subcategories of combined acts correspond to the 3 types of elaborated acts. Gestural object use is identical to the second type of gestural representation without any material support. As seen in Fig. 1, there were marked individual differences on onset except for imitative object use and self agent use. For the purpose of examining the developmental sequence of onset within and across categories, the Friedman two-way analysis of variance by ranks followed by pairwise comparisons with the Wilcoxn matched-pairs signed-ranks test or the sign test for two correlated samples, and either of the latter 2 tests were applied.

(1) Within categories

(i) object use

Despite subsequent appearance of imitative and substitute object use after onset displayed by all subjects, gestural object use was not always observed at consecutive months. All the subjects performed imitative use by 14 months, whereas substitute use occurred in 75% or more subjects by 18 months and gestural use in 33% subjects by 24 months. The order of onset from imitative to substitute and then to gestural use was significant ($\chi^2_r = 47.47$, $df = 2$, $P < .001$, two-tailed).

All the substitute use was based on the subjects' actual experiences. Besides, most of the signifier and the signified were similar in form and/or quality. Yet substitute use of junk materials and miniature toys prior to imitative use of the same toys (type 1) was demonstrated at earlier months than substitute use of miniature toys after imitative use of the counterparts (type 2). This trend was clear-cut in 11 out of 18 subjects while the remainder first exhibited both types of

substitution at the same months. Type 1 substitution emerged at 14 months of the median age (R = 12 - 22) and type 2 at 18 months (R = 14 - 24). Type 2 is regarded as advanced because the subjects had to produce different meanings from the conventional meaning of the object. Some examples of type 2 were using a hand mirror as a bat for baseball and a chopstick as a screwdriver, a pencil, or an earpick. While substitute object use toward self was observed in all the subjects by 22 months, that toward a passive and an active other agent occurred in 67 and 17% subjects by 24 months, respectively. In addition, substitute object use toward other agents did not always appear at successive months after onset. The progression from self- to passive other- and then to active other-directed substitute object use was found ($\chi^2_r = 19.08$, df = 2, $P < .001$, two-tailed).

(ii) agent use

Self and passive other agent use first appeared as acts combined with imitative object use. In passive other agent use, 71% subjects showed such behavior directed to the mother first; that is, the first passive other agent tended to be mother. Using the doll as an active other agent without any other object use occurred at earlier months in 44% subjects than behavior towards the mother or the experimenter as an active other agent with imitative object use. In fact, by 24 months, the repertory of using the doll as an active other agent was limited to having it stand up, walk, lie down or sit down on the floor or a table as a substitute for a bed or chair. None of the subjects had the doll use other materials such as a cup, a spoon, etc. Self and passive other agent use was observed at subsequent months after onset but active other agent use was not always. All the subjects showed self agent use by 14 months, although passive and active other agent use occurred in 75% or more subjects by 16 months and by 24 months, respectively. The sequence of onset from self to passive other and then to active other agent use was significant ($\chi^2_r = 26.03$, $P < .001$, two-tailed).

(iii) combined acts

Any of the 4 subcategories of combined acts was not always seen at consecutive months after onset, while ordered multischemes showed such a

trend in most of the subjects. Disregarding types of multischemes, however, elaborated acts exhibited such a trend in all the subjects. 75% or more subjects performed ordered and unordered multischemes by 18 months, single scheme combinations by 20 months, and organized multischemes by 24 months. Ordered multischemes preceded single scheme combinations ($T = 7.5$, $N = 11$, $P < .03$, two-tailed). Organized multischemes appeared at later months than ordered multischemes, unordered multischemes, or single scheme combinations ($x = 0$, $N = 17$, $P = .0000$, for ordered multischemes; $x = 0$, $N = 16$, $P = .0000$, for unordered multischemes; $x = 2$, $N = 16$, $P = .004$, for single scheme combinations; two-tailed). As opposed to our prediction, ordered multischemes were observed at earlier months, and there were nonsignificant differences of onset between ordered and unordered multischemes and between unordered multischemes and single scheme combinations. Most of ordered multischemes at earlier months were stirring in a cup with a spoon and then drinking, or poking in a rice bowl or a plate with chopsticks and then eating. The organized multischemes seen most often were brushing teeth or combing while looking in a hand mirror, or eating with chopsticks and a rice bowl and/or a plate at a table.

The progression from single or simple acts to ordered multischemes or elaborated acts was obvious in 13 out of 18 subjects with the rest performing both types of acts at 12 months. Single acts probably had emerged at earlier months in these 5 subjects since they also showed better scores in other measures.

(iv) others

As far as the sequence of onset within gestural representation is concerned, the order from imitation of actions or movements to gestural object use was not clear because both acts were observed in a part of subjects and not always at subsequent months after onset. One subject exhibited this trend. Three subjects performed only imitation of actions or movements and 5 subjects did merely gestural object use by 24 months. Across the instances of gestural object use, the subjects represented a static absent object by gesture but not the movement of an absent object, e.g., pretending to give an imaginative object to the

mother. Verbal representation also occurred in some of the subjects at later months.

(2) Across categories

Across 3 categories, all the subjects exhibited the same month of onset among imitative object use, self agent use and a single act. The sequence of emergence was not significantly different among type 1 substitute object use, passive other agent use, and ordered and unordered multischemes ($\chi^2_r = .51$, df = 3, $P > .9$, two-tailed) or among type 2 substitute object use, active other agent use and organized multischemes ($\chi^2_r = 3.69$, df = 2, $P > .1$, two-tailed).

Single scheme combinations were subsequent to type 1 substitute object use ($T = 19.5$, $N = 14$, $P < .05$, two-tailed) and to passive other agent use ($T = 0$, $N = 6$, $P = .05$, two-tailed). Gestural object use was preceded by active other agent use ($x = 1$, $N = 12$, $P = .006$, two-tailed) and by organized multischemes ($x = 0$, $N = 12$, $P = .0004$, two-tailed).

The main results of this section are summarized in Fig. 2.

2. Age Trends for the Increment in Measures of Symbolic Play

The increment in measures of symbolic play was seen in Fig. 3 ∿ Fig. 8. The median and semi-interquartile were selected due to the skewed distribution at some months of a part of measures. As implied from Fig. 6 and Fig. 8, imitative object use and self agent use dominated in general at this age level. The trend test for the increase with age in each measure was adopted from Iwahara (1974a, p. 238 and p. 245). The steps involved in the procedure are as follows:

(1) Compute the Spearman rank correlation coefficient between measurements and ages for an individual subject.

(2) Regard the difference between the above coefficient and the expected coefficient of the null hypothesis ($r_s' = 0$) as a score of the subject.

(3) Apply the formula below to test for significance.

$$t = \frac{\bar{x}}{\sqrt{u^2(\bar{x})}} \quad , \quad df = m - 1$$

$$u^2(\bar{x}) = \frac{\Sigma (x - \bar{x})^2}{m(m-1)}$$

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where m = number of cases.

Among 6 measures shown in Fig. 3 ∿ Fig. 8, only the total number of different acts significantly increased with age ($t = 1.761$, $df = 17$, $P < .05$, one-tailed) while the median of each measure displayed an increment with variations. Actually, all the subjects showed significant rank correlation coefficients in the total number of different acts ($P < .05$ or better, one-tailed). However, significant coefficients in other measures were 83% in the number of different elaborated acts, 72% in the number of different referents in substitution and higher level, 67% in percent occurrence of symbolic play, 56% in percent other agent use, and 50% in percent substitution and higher level. These results reflect the variability of increment in individual subjects. Patterns of increase in each measure were examined.

With respect to percent occurrence of symbolic play, 7 subjects exhibited a peak in 2 sessions between 18 and 22 months and decrease at later months. Especially, 3 out of 7 subjects showed more than 70% of occurrence at either 20 or 22 months. The sharp increase of the total number of different acts was seen at 22 or 24 months in 9 subjects with stable increment at subsequent months. These 9 subjects performed more than 20 different acts at 24 months or at both 22 and 24 months. The number of different elaborated acts increased rather gradually with variations in most of the subjects, except for 2 subjects showing rapid increments at 16 or 24 months. However, 3 or more different sequential acts on a theme were observed at 18 months of 11 subjects and at 24 months of all the subjects. At 24 months, 6 subjects displayed 5 or more such acts. The patterns of the increment of percent substitution and higher level were varied across subjects. Yet a rapid increase occurred at 14 and/or 18 months of 8 subjects with a decrement at successive months in 6 out of 8. There were no instances of sharp increment in the number of different referents in substitution and higher level. But considerable increments and decrements were seen at 16 months in 2 subjects each. Various patterns were seen in the increase of percent of other agent use. However, 4 subjects exhibited rapid increases at 14 or 16 months and decreases at later months. This agent use was mainly

passive other. Another 4 subjects revealed sharp increments at 24 months mostly due to the onset of active other agent use.

3. Interrelations of the Measures of Symbolic Play

1) Within categories

There were 55 variables of onset and increment measures of symbolic play. The measurements of each variable were changed to ranks due to the skewed distributions in some variables of increment measures. The Spearman rank correlation coefficients were computed by a computer HITAC M-150 (Tokyo Gakugei University).

Neither onset of 4 types of object use nor that of 3 types of agent use was significantly correlated. Within onset of combined acts, ordered, unordered and organized multischemes showed significant intercorrelations ($r_s = .884 \sim .618$, $P < .01$, two-tailed), whereas single scheme combinations did not with unordered or organized multischemes. The onset of elaborated acts exhibited significant coefficients with onset of any types of combined acts ($r_s = .901 \sim .658$, $P < .01$, two-tailed). The onset of single acts was not significantly correlated with onset of any types of combined acts or that of elaborated acts.

The 7 variables of each increment measure did not always show significant intercorrelations but tended to show them at earlier and later months or at adjacent months. The significant coefficients ($P < .05$ or better, two-tailed) were 81% in the number of different elaborated acts, 52% in the number of different referents in substitution and higher level, 38% in the total number of different acts, 33% in percent substitution and higher level, 29% in percent occurrence of symbolic play and 24% in percent other agent use.

2) Across categories

Since onset of imitative object use, self agent use and single acts was not significantly correlated with other variables, these three were excluded in the analysis below. Cluster analysis was applied using a correlation matrix as input data. A computer program was BMDP1M by Hitachi and average linkage algorithm was selected as an amalgamation rule.

As seen in Fig. 9, 52 variables were classified into 7 groups.

Five variables did not fall into these 7 groups due to low coefficients with other variables. Groups 1, 2 and 6 are regarded as groups of substitute object use while group 1 is that of earlier months and groups 2 and 6 are those of later months. Yet group 2 was more related with group 1 than group 6. Groups 3 and 7 are other agent use of earlier and later months, respectively. The onset of single scheme combinations was grouped with the variables of other agent use of earlier months rather than with onset of other combined acts, although all instances were imitative object use in onset of each type of combined acts. Group 4 is referred to as imitative object use of earlier months since increment variables of this group were dominated by imitative object use. The superiority of imitative object use was also seen at later months. Thus group 5 is imitative and gestural object use of later months. When the cluster analysis was done for the increment variables of earlier or later months with all onset variables, onset of gestural object use was classified with the variables of imitative object use even at earlier months. Therefore, groups 4 and 5 should correspond.

4. Individual Differences of Development

Individual differences were analyzed based on the groups of variables resulting from the cluster analysis. However, group 2, substitute object use of later months, was excluded in the analysis below since it was more related with substitute object use of earlier months than the other group of substitute object use of later months. The ranks in each selected variable were transformed into percentile ranks and then into T scores (Iwahara, 1974b). The mean of T scores in the variables of each of the remaining 6 groups was calculated for each subject. The 18 means of each of the 6 groups were converted into ranks and then into percentile ranks across subjects. Since most of the subjects showed varied percentile ranks across the 6 groups, their development was examined on the basis of 50 percentile ranks, higher or lower.

Only 4 subjects exhibited constant developmental patterns across 3 categories of the 6 groups. The 3 categories were imitative and gestural object use, substitute object use and other agent use, combining 2 corresponding groups of earlier and later months. Two subjects showed

higher ranks in the 3 categories while one subject revealed lower ranks. The other one displayed higher ranks in other agent use but lower ranks in the other 2 categories. The rest showed various patterns of change from earlier to later months. Consequently, developmental patterns were checked from 3 different points of view; within earlier or later months, within a category of groups and between 2 different groups of earlier or later months.

As shown in Table 2, the number of subjects was not much different among 8 patterns of earlier or later months. Eight and 10 subjects showed constant and variable patterns, respectively, across 3 groups of earlier months. The difference of these 2 numbers was small. The same tendency was clear at later months (Table 2). Table 3 displays the constancy and change of development within a category. The number of subjects did not differ markedly among 4 patterns in any category. Also there was not much difference between the number of subjects showing constancy and the number showing a change of development in any category; namely, 10 and 8 subjects, respectively. Even examining the developmental patterns by combining the groups into 2 different groups of earlier or later months, the number of subjects did not differ much among 4 different patterns. Regarding constant and variable patterns in combinations, the difference of the number of subjects was largest in a combination of imitative and gestural object use and substitute object use at later months, and in that of substitute object use and other agent use at later months. Twelve and 6 subjects showed constant and variable development, respectively, in both combinations. However these differences were not significant ($P > .2$, two-tailed, binomial test).

DISCUSSION

1. Onset and Increment of the Measures of Symbolic Play

The results on the developmental sequence of onset within object use, within agent use and from single acts to combined acts were identical with not only our previous findings with 4 children but also other studies (Belsky & Most, 1981; Elder & Pederson, 1978; Fenson et al.,

1976; Fenson & Ramsay, 1980, 1981; Jackowitz & Watson, 1980; Inhelder et al., 1972; Lowe, 1975; Nicolich, 1977, 1981; Piaget, 1945/1962; Watson & Fischer, 1977). However, the order of onset of combined acts differed from that in other studies (Bates, 1979; Fenson & Ramsay, 1980; Nicolich, 1977, 1981). Ordered multischemes were observed at earlier months and preceded single scheme combinations, while there were nonsignificant differences of onset between ordered and unordered multischemes and between unordered multischemes and single scheme combinations. Onset of single scheme combinations was subsequent to that of passive other agent use and more related to the variables of other agent use than onset of other combined acts in the cluster analysis in spite of interrelations among the other 3 types of combined acts. Therefore, an ability of other agent use is probably a stronger factor in single scheme combinations than that of combining acts. Since the other 3 types of combined acts, especially unordered and ordered multischemes, appeared first as self agent use, it might be better not to regard single scheme combinations as a type of combined acts. Organized multischemes emerged at later months than any other combined acts. While overt planning behavior was not always observed in this study, organized multischemes are supposed to reflect preceding planning. In this sense, these acts are similar to planned symbolic games or internally directed symbolic games referred by Nicolich (1977, 1981). The last onset of these acts among combined ones is supported by her studies.

The relations among onset of the measures across categories support Level 2 and Level 5 of symbolic play by Nicolich (1977, 1981) but not Level 3 and Level 4. Imitative object use, self agent use and single acts are characteristics of Level 2. At Level 5, substitute object use, i.e., the type 2 of that in this study, active other agent use and planned acts emerge. In this study, onset of 3 measures at each level was not significantly different. While passive other agent use and multischemes are components of Level 3 and Level 4, respectively, there were nonsignificant differences of onset not only among passive other agent use, unordered and ordered multischemes ($\chi^2_r = .444$, $df = 2$, $P > .8$, two-tailed) but also among these 3 measures and type 1 substitute object

use. The inconsistency between Nicolich's 2 levels and our results is mainly due to earlier onset of multischemes in this study. Yet the factors affecting the earlier onset are not clear.

As far as the increment measures are concerned, dominance of self agent use and imitative object use at this age level is the same as that of our previous study. It was also confirmed that the total number of different acts was the most appropriate developmental index among the increment measures of this study. Symbolic play first appears around the beginning of the second year of age and component skills emerge at different months. Since most skills are in the process of development, it is considered natural that the developmental pace of a skill is unstable. Thus a measure of a larger category of skills such as the total number of different acts may result in being a better increment index. Nevertheless, when children are observed over a larger span of months, a measure of a smaller category of skills or even that of each skill may be feasible. Comparing age trends of increment between the total number of different acts and percent occurrence of symbolic play or between the number of different referents and percent of substitution and higher level, measures reflecting repertory rather than frequency are suggested to be more suitable.

2. Interrelations of the Measures of Symbolic Play and Individual Differences

Corresponding onset and increment variables were classified into the same groups in the cluster analysis. Yet the variables of the same increment measures were grouped into those of earlier or later months. This implies that there is not only a close relationship between onset and increment measures at limited months but also the change of development in the subjects.

The change of development was more obvious in the individual differences of developmental patterns. Fourteen out of 18 subjects showed change of development in the categories of imitative and gestural object use, substitute object use or other agent use. Examining each of the above 3 categories, almost half of the subjects revealed change of development. Wolf & Gardner (1979) found 2 types of children in the

development of symbolic play, patterner and dramatist. Since our data analysis is different from that of the above study, a comparison is rather difficult. However, other agent use of this study is supposed to be parallel to a characteristic of a type of children, person-centered play of dramatist by Wolf & Gardner. In this study, change of development of other agent use was seen in about half of the subjects. Since their subjects were 9 children, such clear patterns of individual differences might be seen in some of the children. Further study is required to examine why children show varied developmental patterns in symbolic play. Investigation on this matter needs to consider the affective as well as cognitive development of children and individual differences in these domains. This direction was suggested by Singer (1973) and examined in empirical studies by Bates (1979) and Hill & Nicolich (1981).

3. Others

The developmental sequence of agent use from self to passive other and then to active other was found in not only imitative but also substitute object use. Conversely, object use went from imitative to substitute use in both self and passive other agent use. Within a combination of self agent use and imitative object use, the progression from self- to object-directed acts was reported by Fenson & Ramsey (1980), while our data was not analyzed on this matter. The instances of self- and object-directed acts were drinking from a cup and stirring in a cup with a spoon, respectively. The above process was also seen in gestural object use of older children (Overton & Jackson, 1973). In our previous study (Shimada et al., 1979), it was suggested that physical similarity between the signifier and the signified was the most strong factor and children's attention to action resemblance between them tended to appear at later months. Ungerer et al. (1981) also revealed the dominance of physical attribute over action in substitute object use at this age level. The same tendency was seen in the study of Overton & Jackson (1973) on development of gestural object use in older children. These findings seem to imply reciprocal interweaving of skills in the development of symbolic play.

When expanding such a viewpoint to other domains of symbolic functioning, appropriate examples are seen in the study by Piaget & Inhelder (1966/1971) on the development of mental imagery. While tasks were mainly drawing of geometric figures in their study, the developmental sequence from static to kinetic reproductive images was noted. The order seems to be parallel to that from substitute to gestural object use in symbolic play since symbolic play is supposed to be mediated by mental imagery. Therefore, spiral development is suggested.

SUMMARY

The purpose of this study was to confirm our previous findings (Shimada et al., 1979) with a larger sample and also to examine in more detail the development of symbolic play.

The subjects were 18 Japanese normal children (9 males, 9 females) and individually tested at even months from 12 to 24 months in laboratory settings. The materials were composed of 3 sets of miniature toys, a doll and junk materials. Each set was presented for 5 minutes and the subject's spontaneous behavior was videotaped.

The developmental sequence of onset of object use and agent use and the movement from single to combined acts were identical with the findings of other studies as well as our previous work. However, the order of onset of combined acts did not support other studies as we found an earlier onset of ordered multischemes compared to single scheme combinations. Since onset of single scheme combinations was classified with the variables of other agent use rather than the onset of other types of combined acts in the cluster analysis, differentiation of this combination from other combinations was suggested. Nonsignificant differences of onset of self agent use, imitative object use and single acts, and of active other agent use, type 2 substitute object use and organized multischemes supported the work of Nicolich (1977, 1981) which described Level 2 and Level 5 of symbolic play. Yet Levels 3 and 4 were not supported since the onset of passive other agent use, type 1 substitute object use, and unordered and ordered multischemes did not differ.

Among the increment measures, the total number of different acts was the most appropriate developmental index in general across months of this age level, which was parallel to our previous finding. Corresponding onset and increment variables were classified into the same groups but the increment variables were grouped into those of earlier or later months in the cluster analysis. Individual differences were obvious not only in onset and increment of the measures of symbolic play but also in developmental patterns. Fourteen out of 18 subjects showed change of development in the categories of imitative and gestural object use, substitute object use or other agent use. Examining each of the above 3 categories, almost half of the subjects revealed change of development. In conclusion, spiral development was suggested.

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Table 1 Definitions of Symbolic Play

1. General Definition

Behavior which represents actual or imagined experience by using objects, gesture or language alone, or in combination.

2. Types of Representation

(1) Material representation

i. imitative use of objects
manipulation of objects according to their appropriate usage, e.g., eating from a rice bowl.

ii. substitute use of objects
manipulation of objects as a substitute for other objects, e.g., eating with a twig as a substitute for a chopstick.

(2) Gestural representation without any material support

i. imitation of actions of the animate or movements of the inanimate, e.g., pretending to have a stomach ache, bowing after a meal, or running around with arms up like an airplane.

ii. gestural use of absent objects, e.g., giving an imaginative object to the mother.

(3) Verbal representation
pretend verbal expression about objects without actions appropriate to the represented objects or about his, her or others' feeling, intention or on-going behavior, e.g., picking up a cup and saying "Milk", saying "It was a nice meal" after eating, or asking the mother "Are you hungry?" and then giving a rice bowl and chopsticks to her.

Note: Verbal representation with actions appropriate to the represented objects was classified into both material and verbal representation, e.g., saying "Coffee" stirring in a cup with a spoon.

3. Types of Agent Use

(1) Self
symbolic play directed towards the subject himself or herself, e.g., drinking from a cup.

(2) Passive other
symbolic play directed towards the mother, the experimenter or the doll as if to treat them as mere recipients of his or her acts, e.g., bringing a cup close to the others' mouths as if to feed them.

(3) Active other
symbolic play directed towards the mother, the experimenter or the doll as if to have them actually participate in the acts, e.g., having the doll walk, handing a cup to the mother or the experimenter and asking them to drink by gestures or verbally, or trying to have the doll hold a cup and drink from it.

4. Types of Elaborated Acts

(1) Unordered multischeme combination
combining 2 different acts in temporal sequence but not in logical order, e.g., pouring from a cup to the floor and then drinking from the cup or combing hair and then brushing teeth.

(2) Ordered multischeme combination
combining 2 different acts in logical order as well as in temporal sequence, e.g., stirring in a cup with a spoon and then drinking from the cup.

(3) Organized multischeme combination
combining 2 different acts almost at the same time in an organized manner, e.g., brushing teeth or combing while looking in a mirror, or eating with a rice bowl and chopsticks at a table.

Table 2 Developmental Patterns at Earlier and Later Months

		Developmental Patterns							
Imitative & Gestural Object Use		+	-	-	+	+	-	+	-
Substitute Object Use		+	-	+	-	-	+	+	-
Other Agent Use		+	-	+	-	+	-	-	+
No. of Ss	Earlier Months	5	3	2	2	2	2	0	2
	Later Months	4	3	2	3	0	1	2	3

\+ 50 or more percentile ranks

\- less than 50 percentile ranks

Table 3 Developmental Patterns within a Category of Variables

		Developmental Patterns			
	Earlier Months	+	-	+	-
	Later Months	+	-	-	+
No. of Ss	Imitative & Gestural Object Use	5	5	4	4
	Substitute Object Use	5	5	4	4
	Other Agent Use	6	4	5	3

\+ 50 or more percentile ranks

\- less than 50 percentile ranks

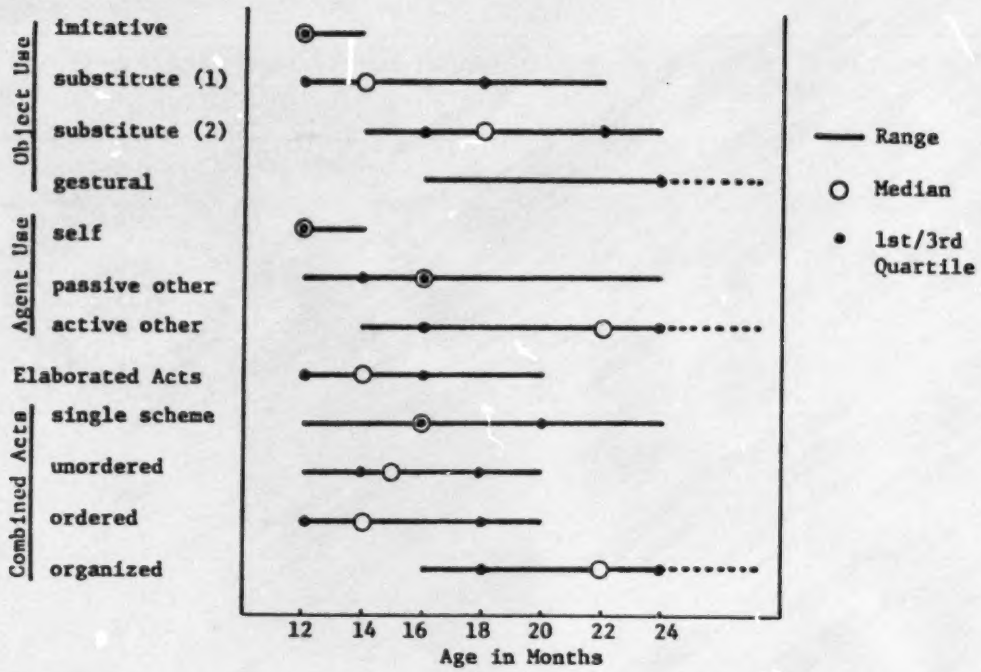

Fig. 1 Onset of the Measures of Symbolic Play

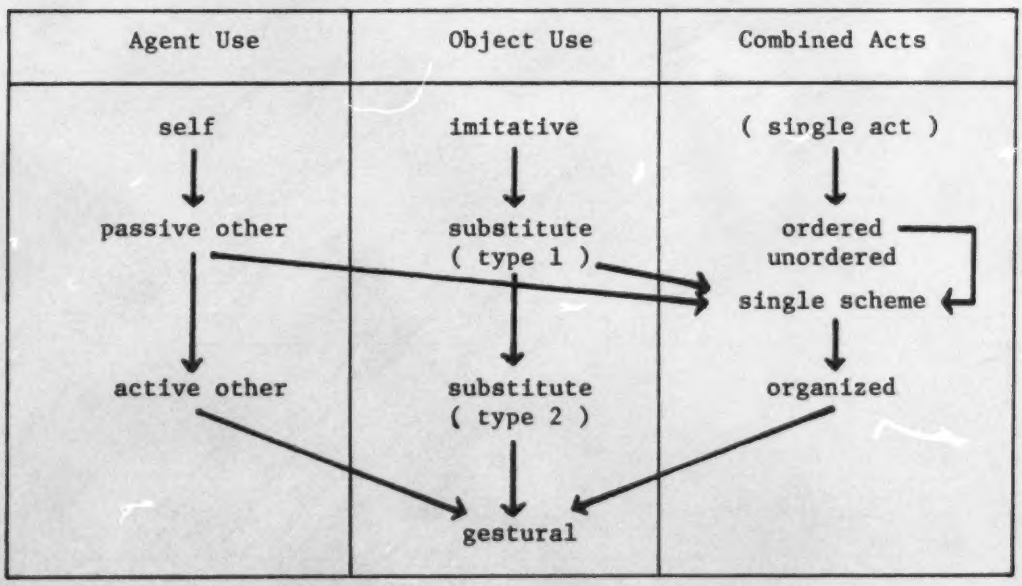

Fig. 2 Developmental Sequence of Onset

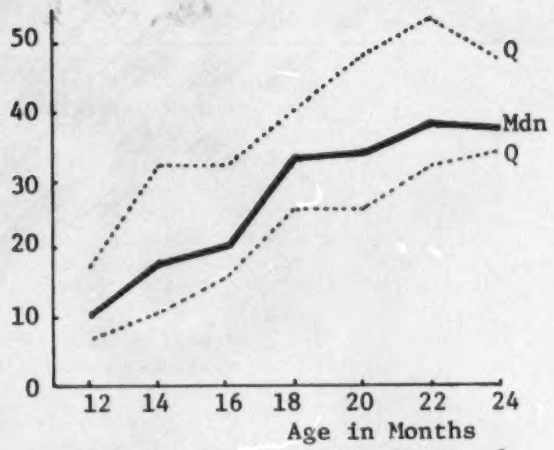

Fig. 3 Percent Occurrence of Symbolic Play

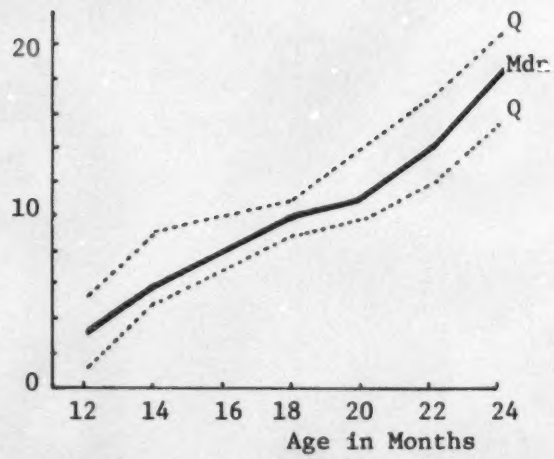

Fig. 4 Total Number of Different Acts

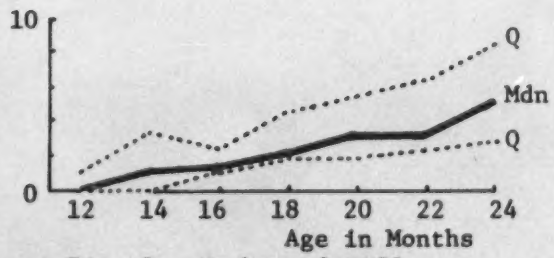

Fig. 5 Number of Different Elaborated Acts

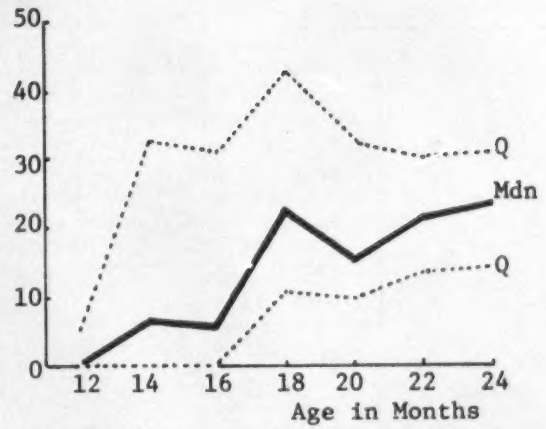

Fig. 6 Percent Substitution and Higher Level within Symbolic Play

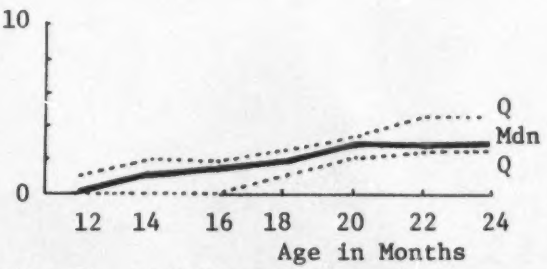

Fig. 7 Number of Different Referents in Substitution and Higher Level

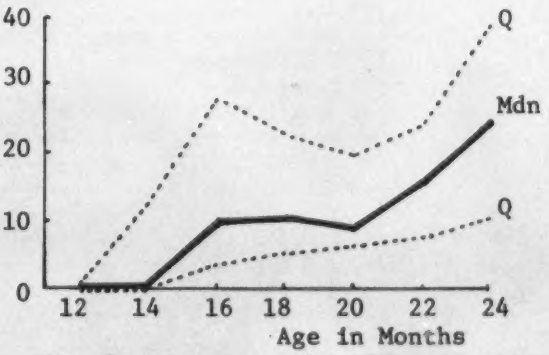

Fig. 8 Percent Other Agent Use within Symbolic Play

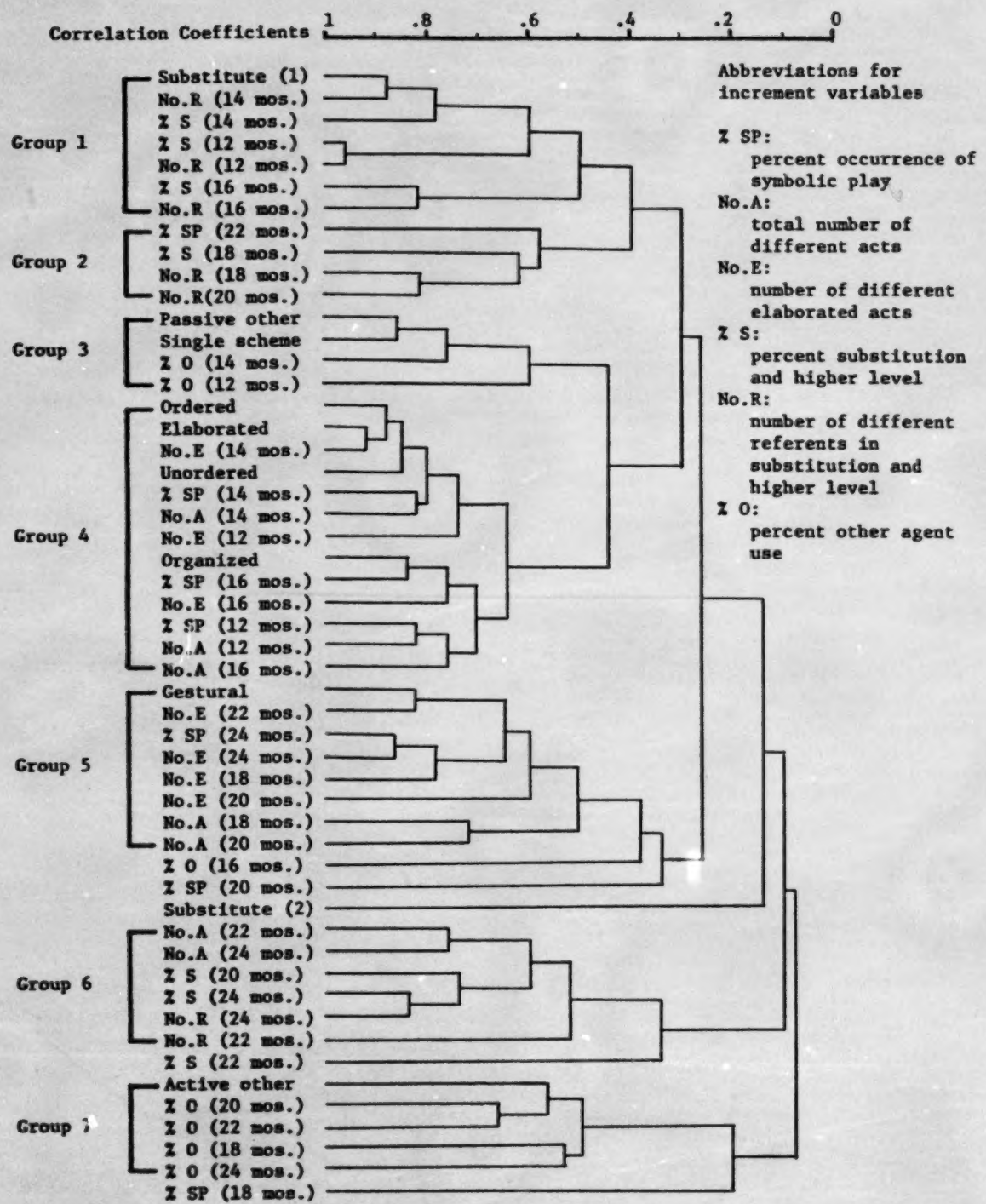

Fig. 9 Dendrogram of Variables